Angular Fundamentals
Module – Component Trees

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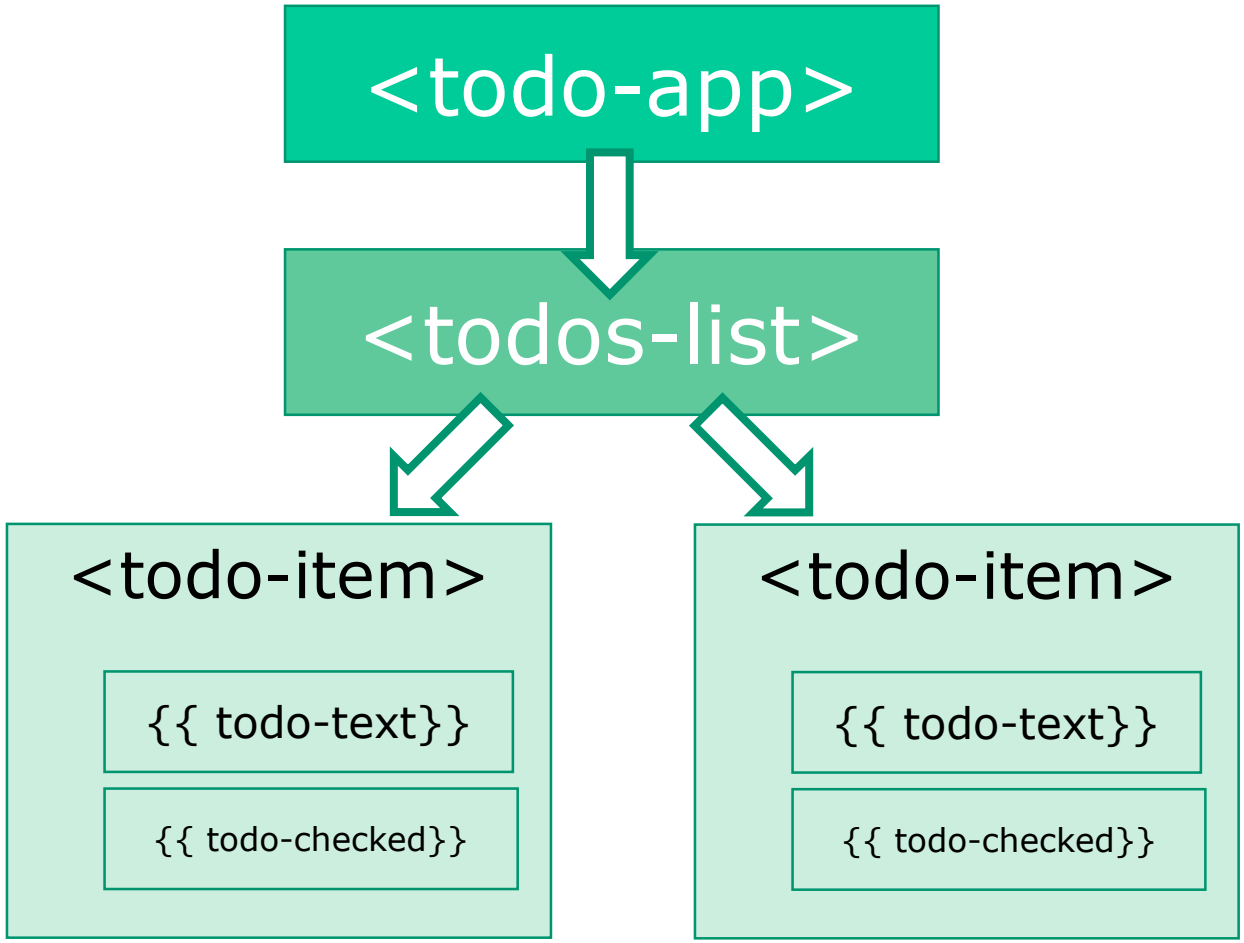
Hoofdstuk 7

p. 182 en verder

Angular-app: Tree of components



Application as a tree of components

- Multiple components?
  1. Create files manually – or let CLI handle this for you
     1. `ng generate component <component-name>`
     2. `ng g c <component-name>`
  2. Import in module – or (again) let CLI take care of this for you
  3. Add to `declarations : […]` section of `@ngModule`.
  4. Add via HTML to `parent`-component

- Repeat for every component

1. Detailcomponent toevoegen

```
// city.detail.ts
import { Component } from '@angular/core';

@Component({
   selector: 'city-detail',
   template: `
   <h2>City details</h2>
      <ul class="list-group">
         <li class="list-group-item">Naam: [naam van stad]</li>
         <li class="list-group-item">Provincie: [provincie]</li>
         <li class="list-group-item">Highlights: [highlights]</li>
      </ul>
   `
})

export class CityDetail{

}
```

Nieuwe selector

Nog in te vullen

2. Injection in Module

```
// Angular Modules
…

// Custom Components
import {AppComponent} from './app.component';
import {CityDetail} from './city.detail';
import {CityService} from "./city.service";

// Module declaration
@NgModule({
    imports      : [BrowserModule, HttpModule],
    declarations: [AppComponent, CityDetail],
    bootstrap    : [AppComponent],
    providers    : [CityService]
})
export class AppModule {
}
```

Nieuwe component

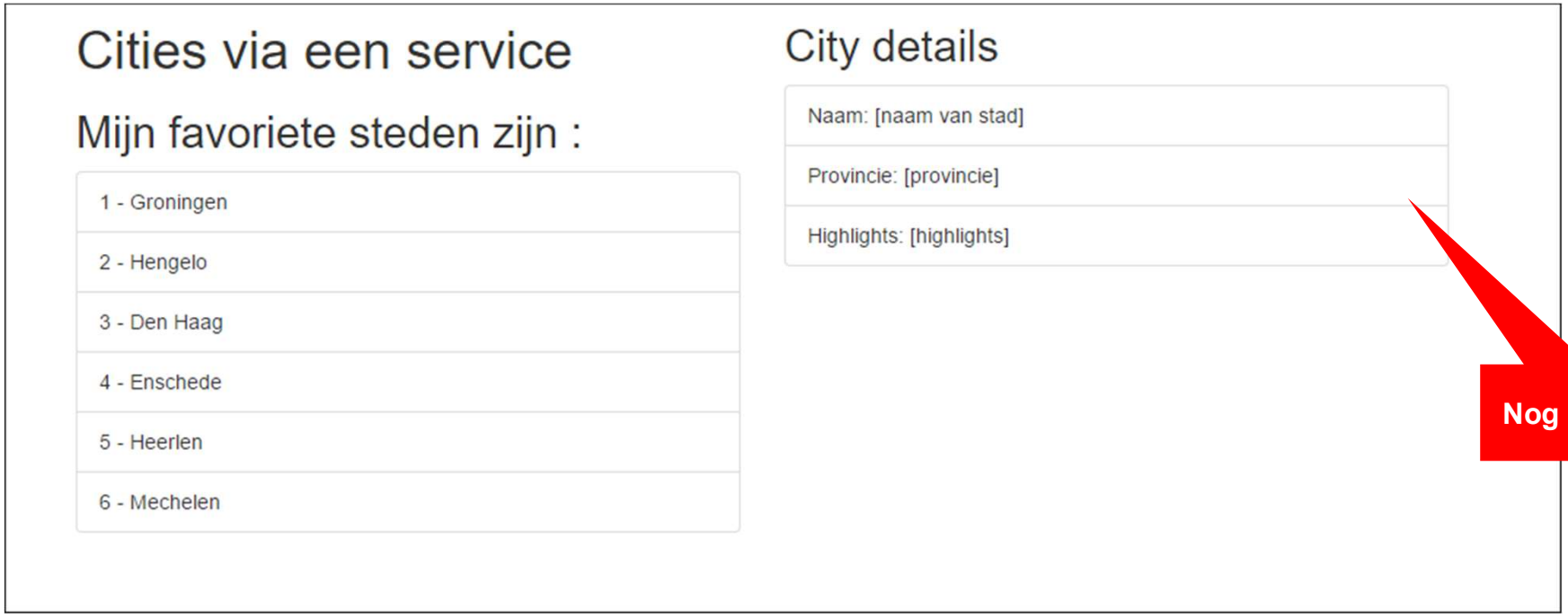
Toevoegen aan declarations: [ ]

3. Insluiten in HTML

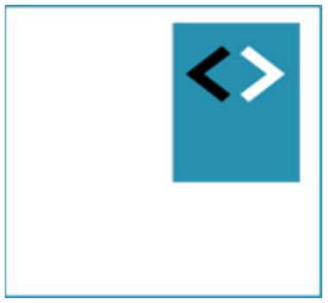
```
<!-- app.html -->
<div class="row">
    …
   <div class="col-md-6">
      …
      <city-detail></city-detail>
   </div>
</div>
```

Combineren met overige HTML

4. Resultaat



Doel: details van geselecteerde city tonen in child-component



Data flow tussen componenten

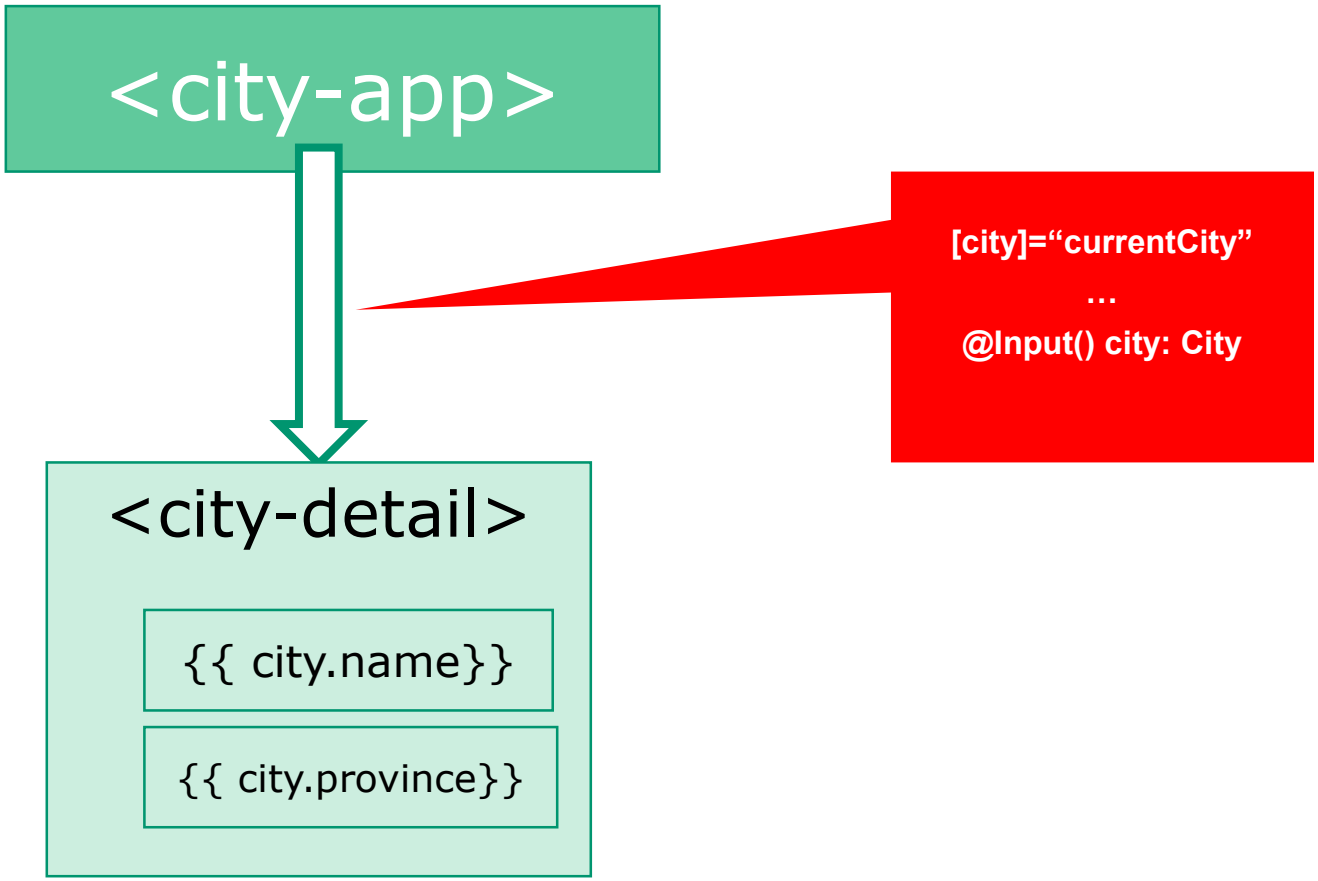
Werken met inputs en outputs

Data flow tussen components

"Data flows in to a component via `@Input()`'s"

Data flows out of a component via `@Output()`'s"

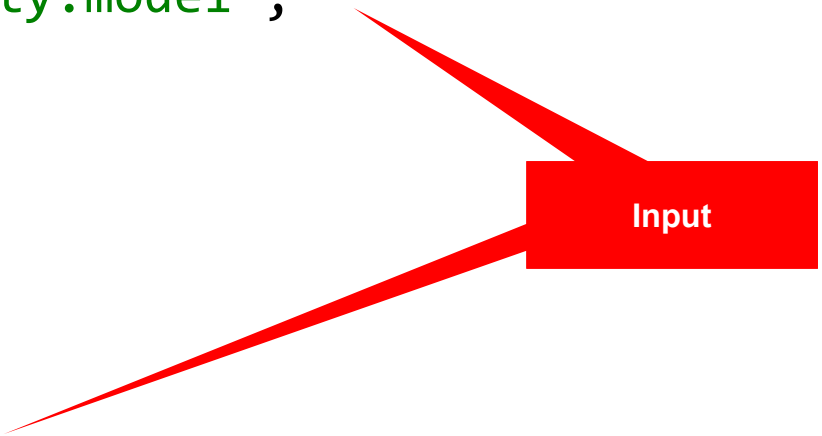
Parent-Child flow: de annotatie `@Input()`



Werken met @Input()

1. Service `Input` importeren in de betreffende component
2. Decorator `@Input()` gebruiken in de class definition

```
// city.detail.ts
import { Component, Input } from '@angular/core';
import { City } from "./city.model";

@Component({
   …
})

export class CityDetail {
   @Input() city: City;
}
```



Parent Component aanpassen voor @Input

```
<!-- app.html -->
<div class="row">
   <div class="col-md-6">
      …
      <ul class="list-group">
         <li *ngFor="#city of cities" class="list-group-item"
                (click)="getCity(city)">
            {{ city.id}} - {{ city.name }}
         </li>
      </ul>
      <button *ngIf="currentCity" class="btn btn-primary"
                (click)="clearCity()">Clear</button>
   </div>
   <div class="col-md-6">
   <div *ngIf="currentCity">
         <city-detail [city]="currentCity"></city-detail>
      </div>
   </div>
</div>
```

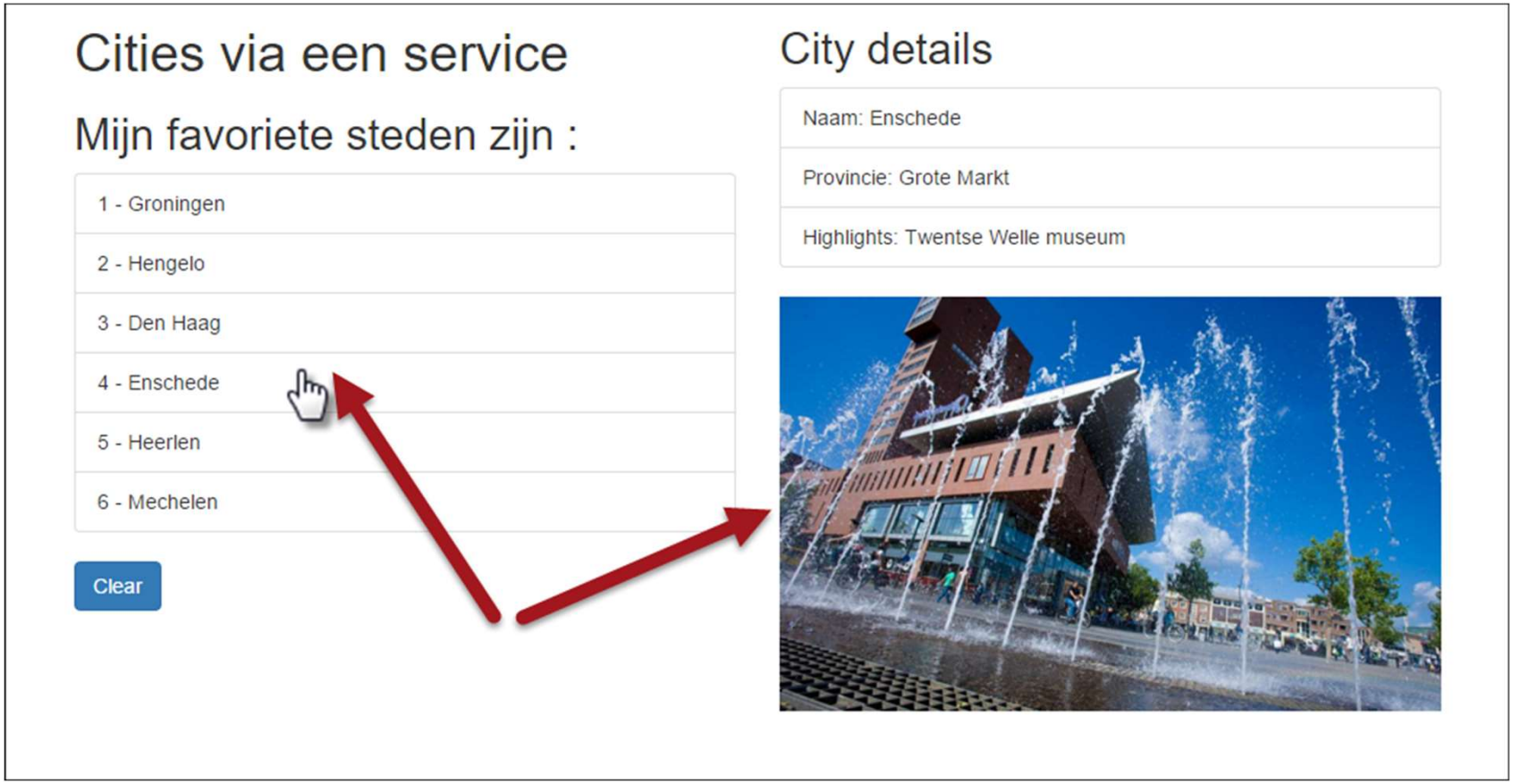
Aanpassing

Aanpassing!

Parent Component Class uitbreiden

```
export class AppComponent {
   // Properties voor de component/class
   public cities:City[];
   public currentCity:City;

   …

   getCity(city) {
      this.currentCity = city;
   }

   clearCity() {
      this.currentCity = null;
   }

   …
}
```

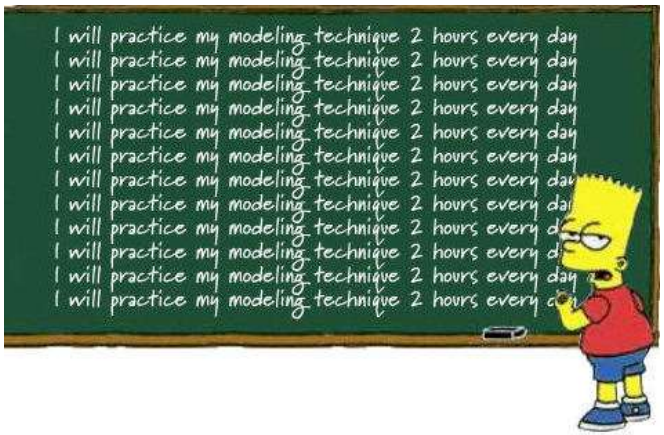
Resultaat


Cities via een service
Mijn favoriete steden zijn :
1 - Groningen
2 - Hengelo
3 - Den Haag
4 - Enschede
5 - Heerlen
6 - Mechelen
Clear
City details
Naam: Enschede
Provincie: Grote Markt
Highlights: Twentse Welle museum

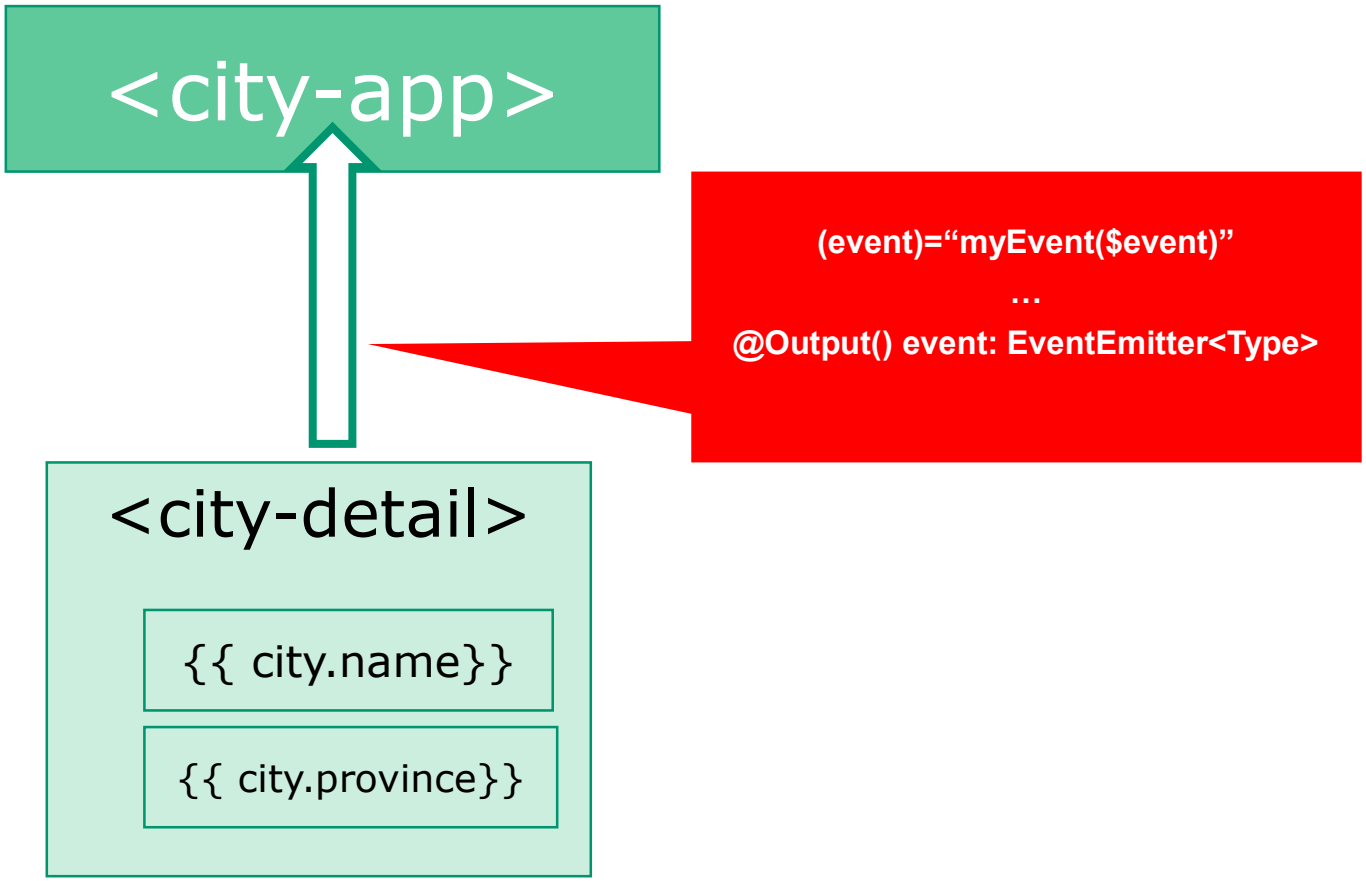
Checkpoint

- Componenten kunnen binnen componenten worden opgenomen
- Breidt de HTML van de Parent Component uit met declaratie van de Child Component
- Denk er aan Child Component te importeren in de `@ngModule`
- Data flow naar Child Component : werken met `@Input()` en `[propName]="data"`
- Oefening: `6b) en 6c)`
- Voorbeeld: `/300-components`

Oefening….



Child-Parent flow: de annotatie `@Output()`



Werkwijze – idem, maar dan andersom

1. Functie `Output` importeren in de betreffende component
2. Decorator `@Output()` gebruiken in de class definition
3. `EventEmitter` definiëren en zijn Type Annotation

“With @Output,

data flows up the Component Chain”

Een rating geven aan Cities

```
// city.detail.ts
import { Component, Input, Output, EventEmitter} from ‘@angular/core';

@Component({
   …
   template: `
   <h2>City details
      <button (click)="rate(1)">+1</button>
      <button (click)="rate(-1)">-1</button>
   </h2>
   …
   `
})

export class CityDetail {
   @Input() city:City;
   @Output() rating: EventEmitter<number> = new EventEmitter<number>();

   rate(num) {
      console.log('rating voor ', this.city.name, ': ', num);
      this.rating.emit(num);
   }
}
```

Imports

Bind custom events to DOM

Define & handle custom @Output event

Parent Component voorbereiden op ontvangen custom event

```
<!-- app.html -->
<div *ngIf="currentCity">
   <city-detail [city]="currentCity" (rating)="updateRating($event)">
   </city-detail>
</div>
```

```
// app.component.ts
// increase or decrease rating on Event Emitted
updateRating(rating){
   this.currentCity.rating += rating;
}
```

Rating tonen in HTML

```
<li *ngFor="let city of cities"
    class="list-group-item" (click)="getCity(city)">
   {{ city.id}} - {{ city.name }} ({{i}})
   <span class="badge">{{city.rating}}</span>
</li>
```

Resultaat

Cities via een service

Mijn favoriete steden zijn :

1 - Groningen	0
2 - Hengelo	0
3 - Den Haag	-3
4 - Enschede	0
5 - Heerlen	2
6 - Mechelen	5

Clear

City details +1 -1

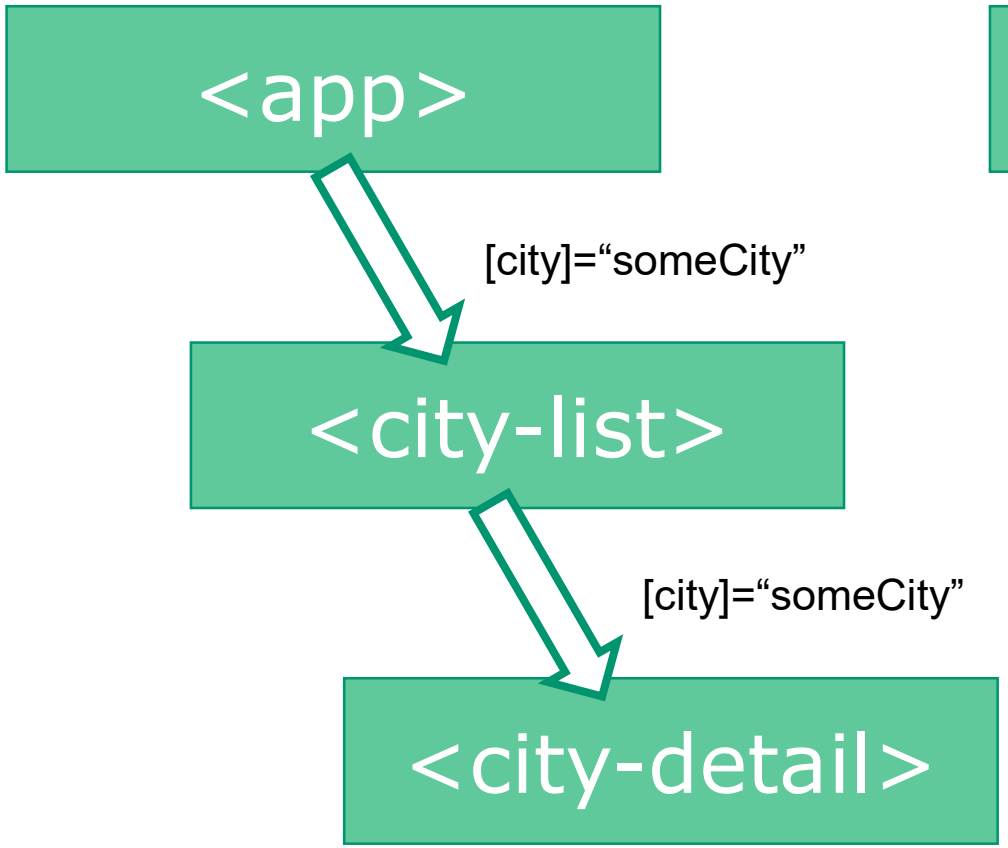
Naam: Den Haag

Provincie: Zuid-Holland

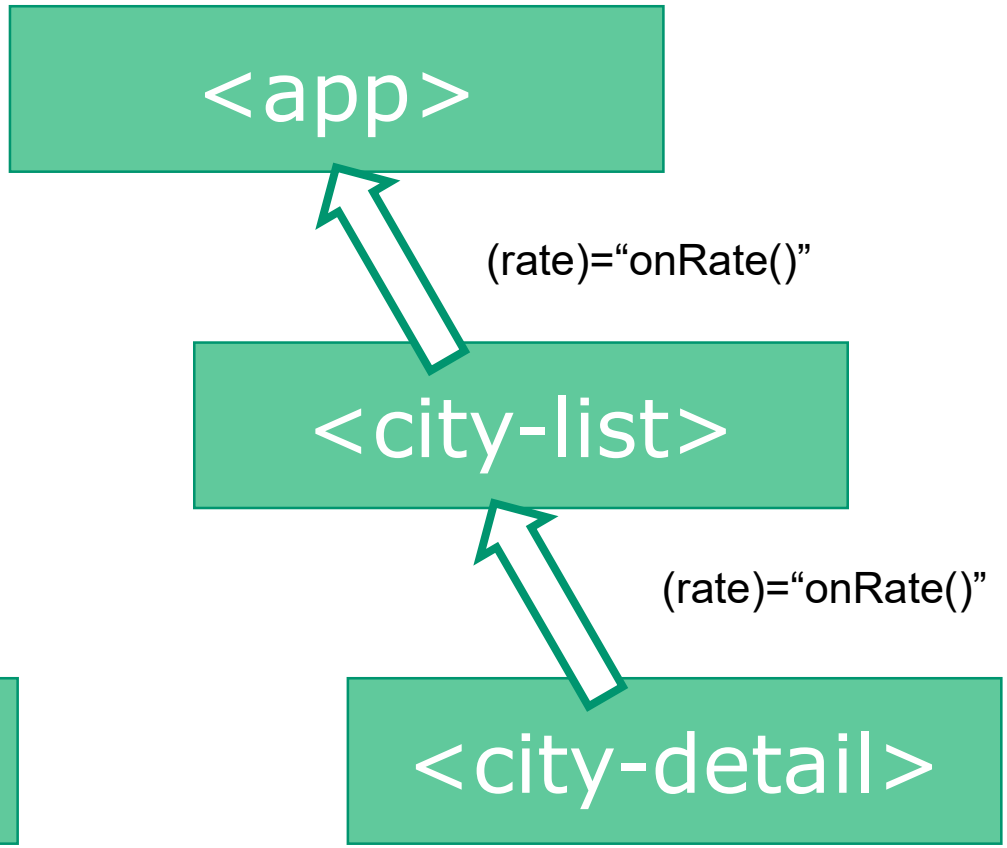
Highlights: Binnenhof

Samenvatting

Parent → Child



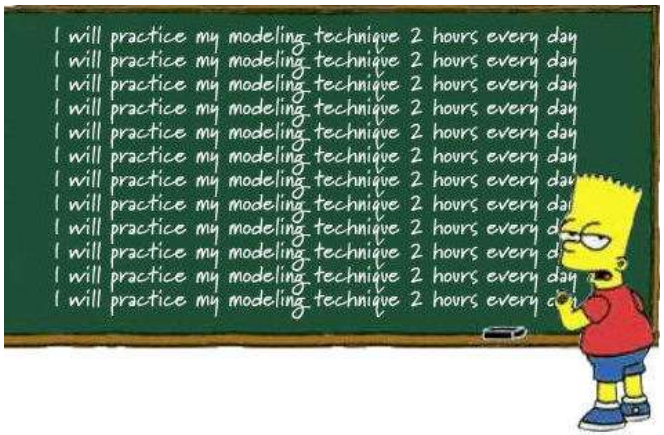
Child → Parent



Checkpoint

- Data flow naar Parent Component : werken met `@Output()` en `(eventName)="eventHandler($event)"`
- Je kunt *elk type* data uitsturen via de `EventEmitter`.
- Oefening: `6d)`
- Voorbeeld: `/302-components-output`
- Meer info: https://vsavkin.com/the-core-concepts-of-angular-2-c3d6cbe04d04

Oefening….

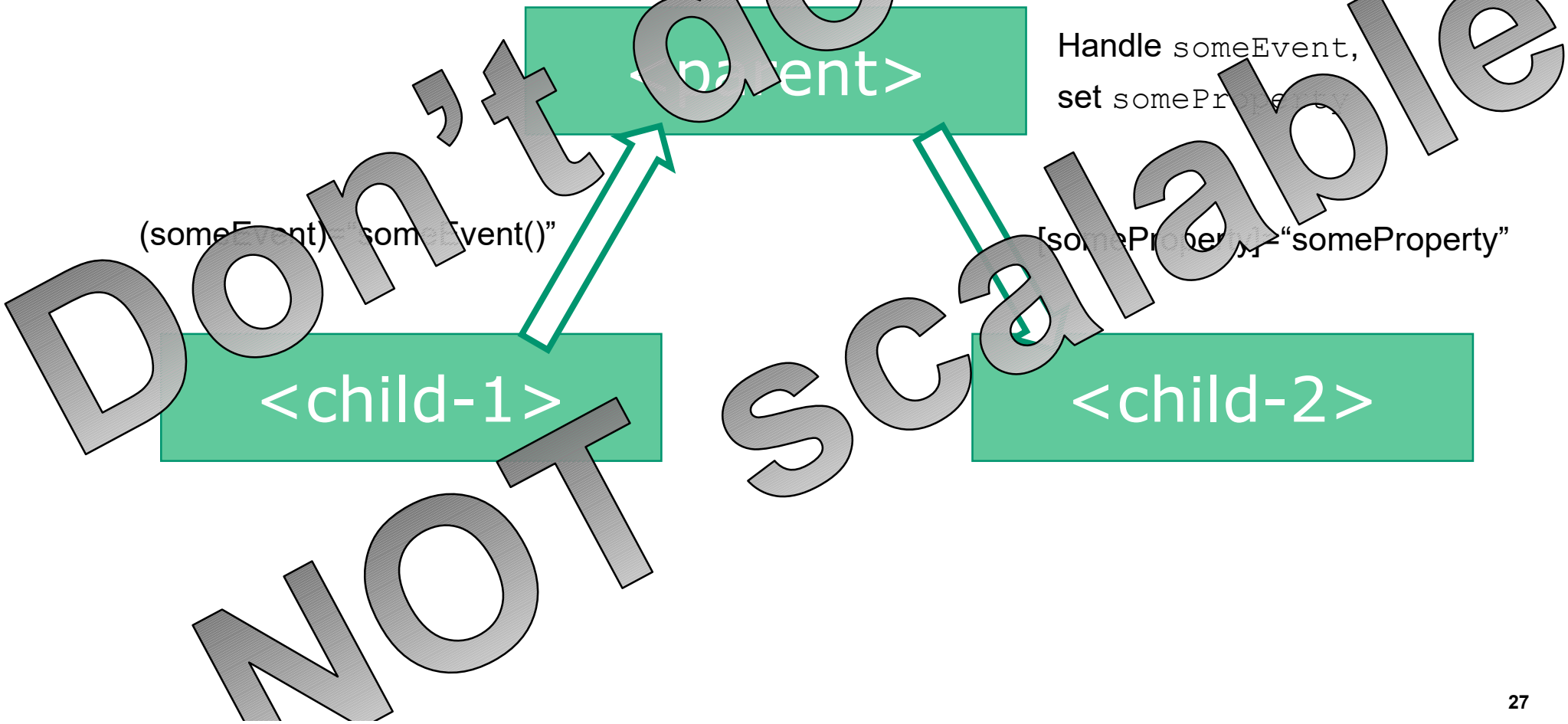


Sibling communication

Geen directe parent-child relatie

Communicatie tussen siblings

- via `Output()` van een childcomponent naar een `@Input()` van andere childcomponent



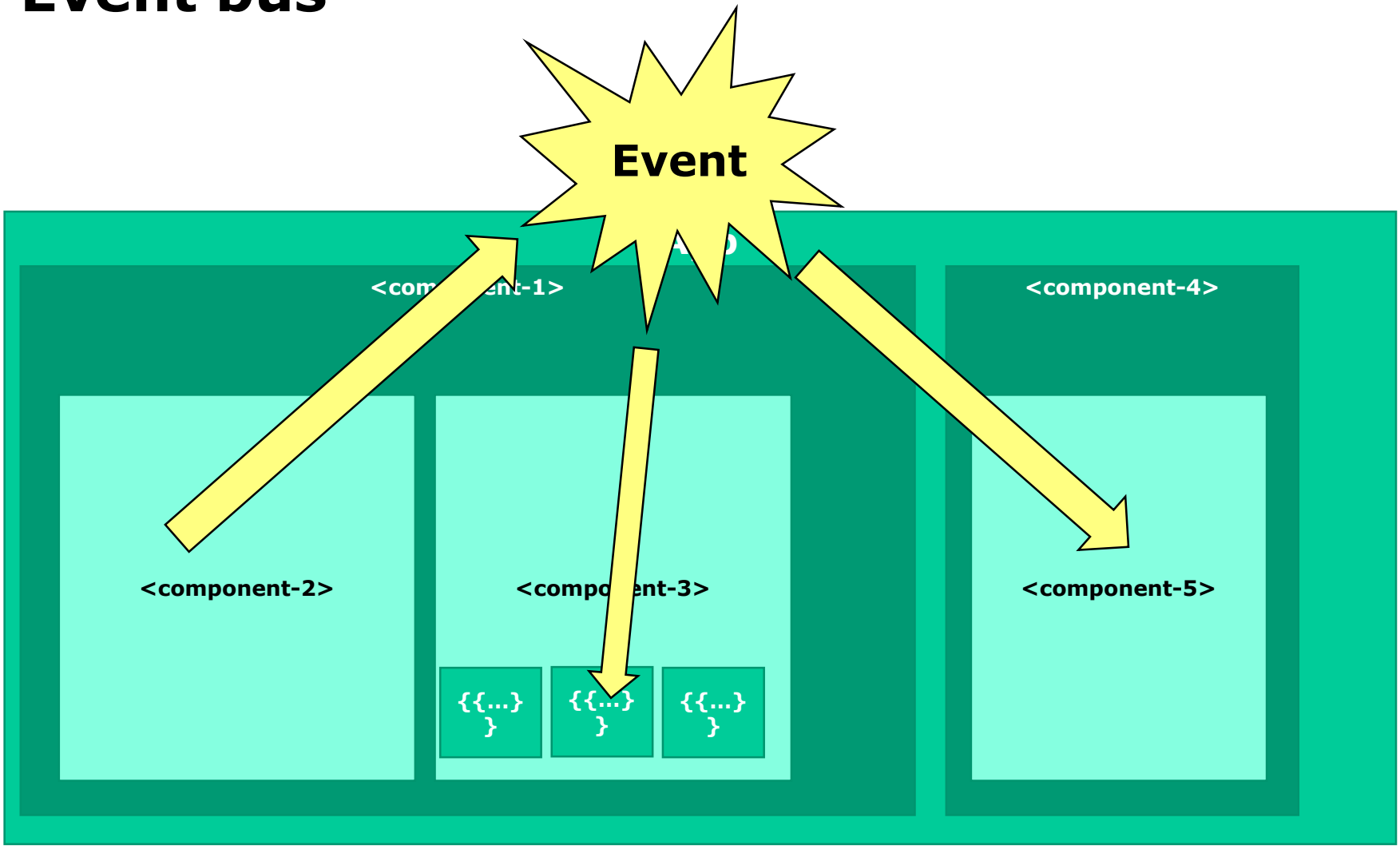
Mooiere oplossing – Pub/Sub-systeem met Observables

- http://www.syntaxsuccess.com/viewarticle/pub-sub-in-angular-2.0

"Custom events,

gebruik een event bus"

Event bus

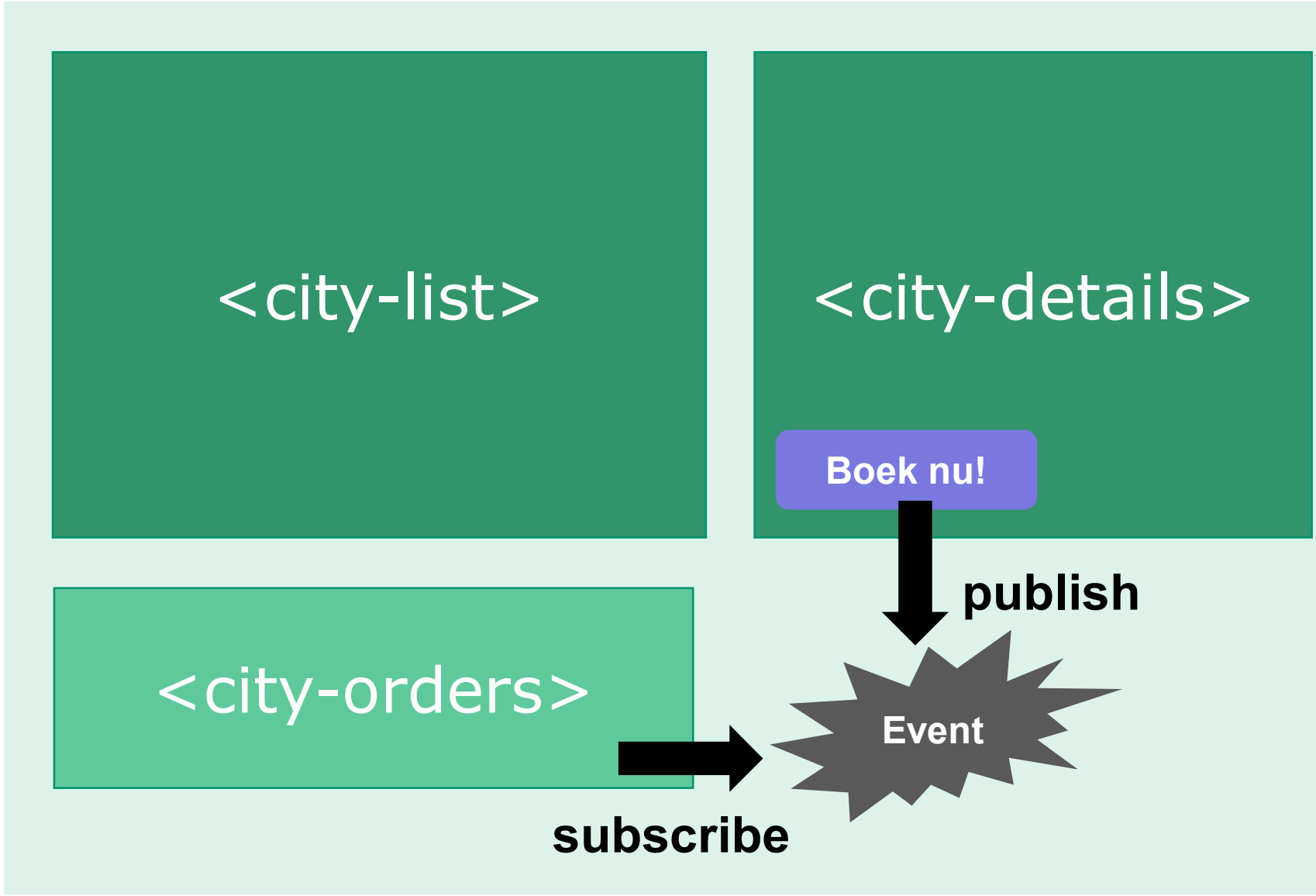


Opties

Uit RxJs-bibliotheek, werken met:

- `EventEmitter()`
- `Observable()`
- `Observer()`
- `Subject()` (zowel `Observable` als `Observer`)

"*Publish en Subscribe*" – PubSub systeem


<city-list>
<city-details>
Boek nu!
publish
<city-orders>
Event
subscribe

PubSub-service maken

- Stap 1 – Publicatie service maken
- Stap 2 – ‘Producer’, of ‘Publish’ – component maken
- Stap 3 – subscriber-component maken, of toevoegen aan bestaande component.

1. OrderService

```
// order.service.ts
import {Subject} from "rxjs/Subject";
import {Injectable} from "@angular/core";
import {City} from "../model/city.model";

@Injectable()
export class OrderService {
   Stream:Subject<City>;

   constructor() {
      this.Stream = new Subject<City>();
   }
}
```

2. Producer component (‘boek nu’-knop)

In de HTML:

```
<h2>Prijs voor een weekendje weg:
{{ city.price | currency:'EUR':true:'1.2' }}
<button class="btn btn-lg btn-info"
   (click)="order(city)">Boek nu!</button>
</h2>
```

In de class:

```
// Order plaatsen. Event emitten voor deze stad.
// Dit gaan opvangen in city.orders.ts
order(city) {
   console.log(`Stedentripje geboekt voor: ${this.city.name});
   this.orderService.Stream.next(city);
}
```

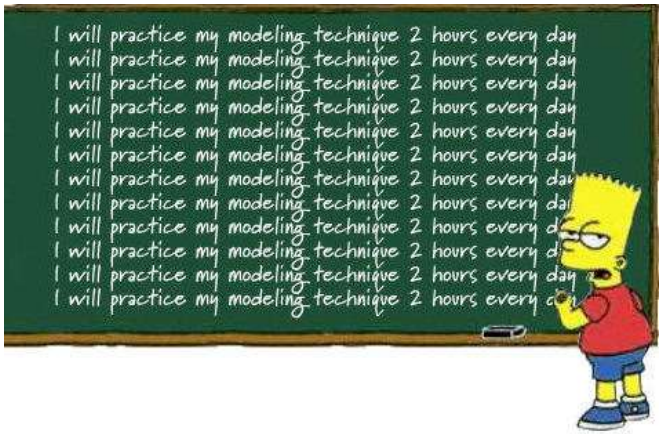
3. Subscriber component

```
//city.orders.ts - Een soort 'winkelmandje',
// bijhouden welke stedentripjes zijn geboekt.
import …

@Component({
   selector: 'city-orders',
   template: `
   <div *ngIf="currentOrders.length > 0">
      …
})

export class CityOrders {
   …
   ngOnInit() {
      this.orderService.Stream
         .subscribe(
            (city:City) => this.processOrder(city),
            (err)=>console.log('Error bij verwerken City-order'),
            ()=>console.log('Complete...')
         )
   }
`    …
}
```

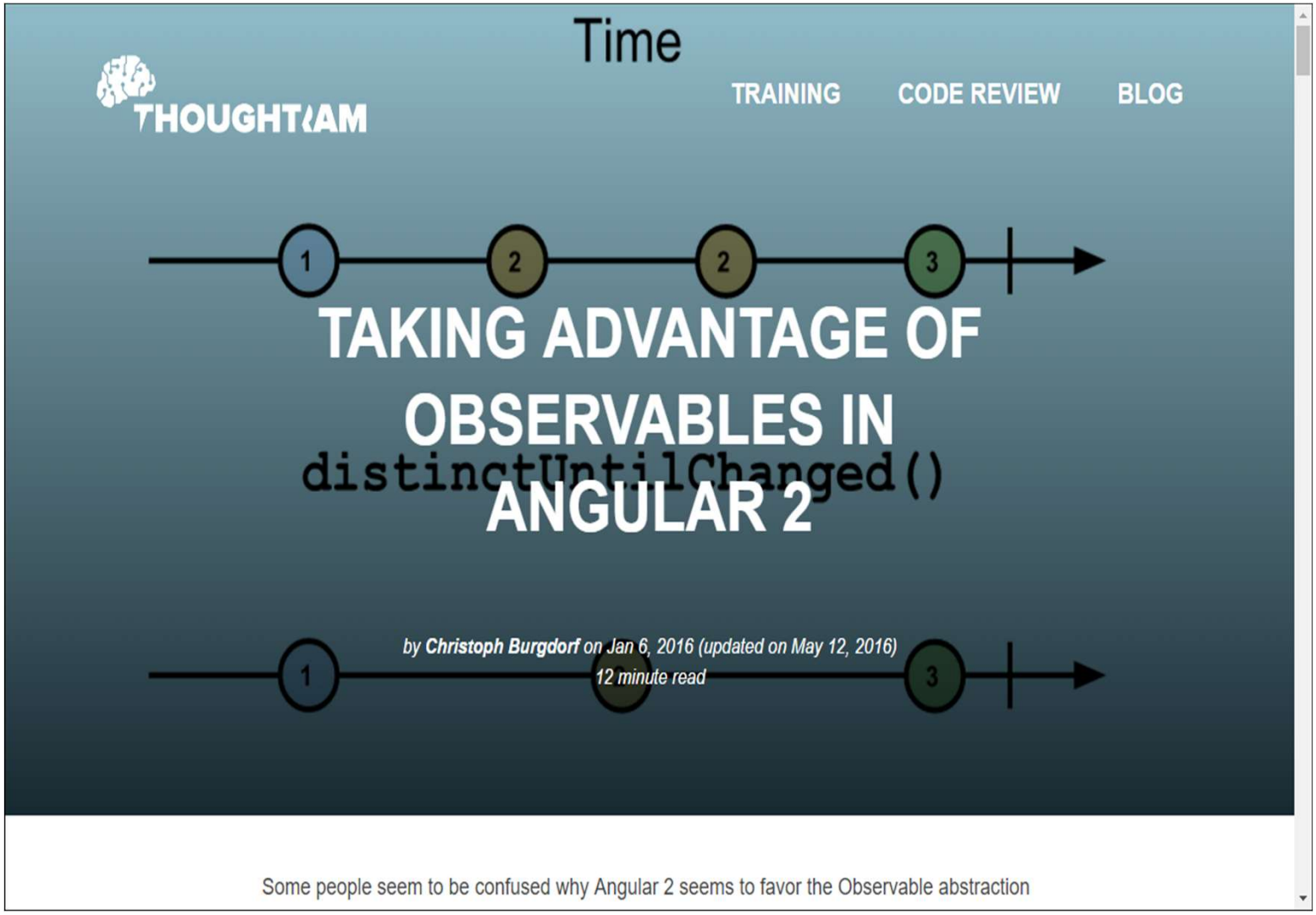
Checkpoint

- Event Bus : 'onzichtbaar' werken met Streams en `Subject`
- Er zijn opties voor het werken met Observable Streams.
- Voorbeeld: `\303-pubsub-ordercomponent`
- Oefening `6e)` e-commerce applicatie maken.

Oefening….

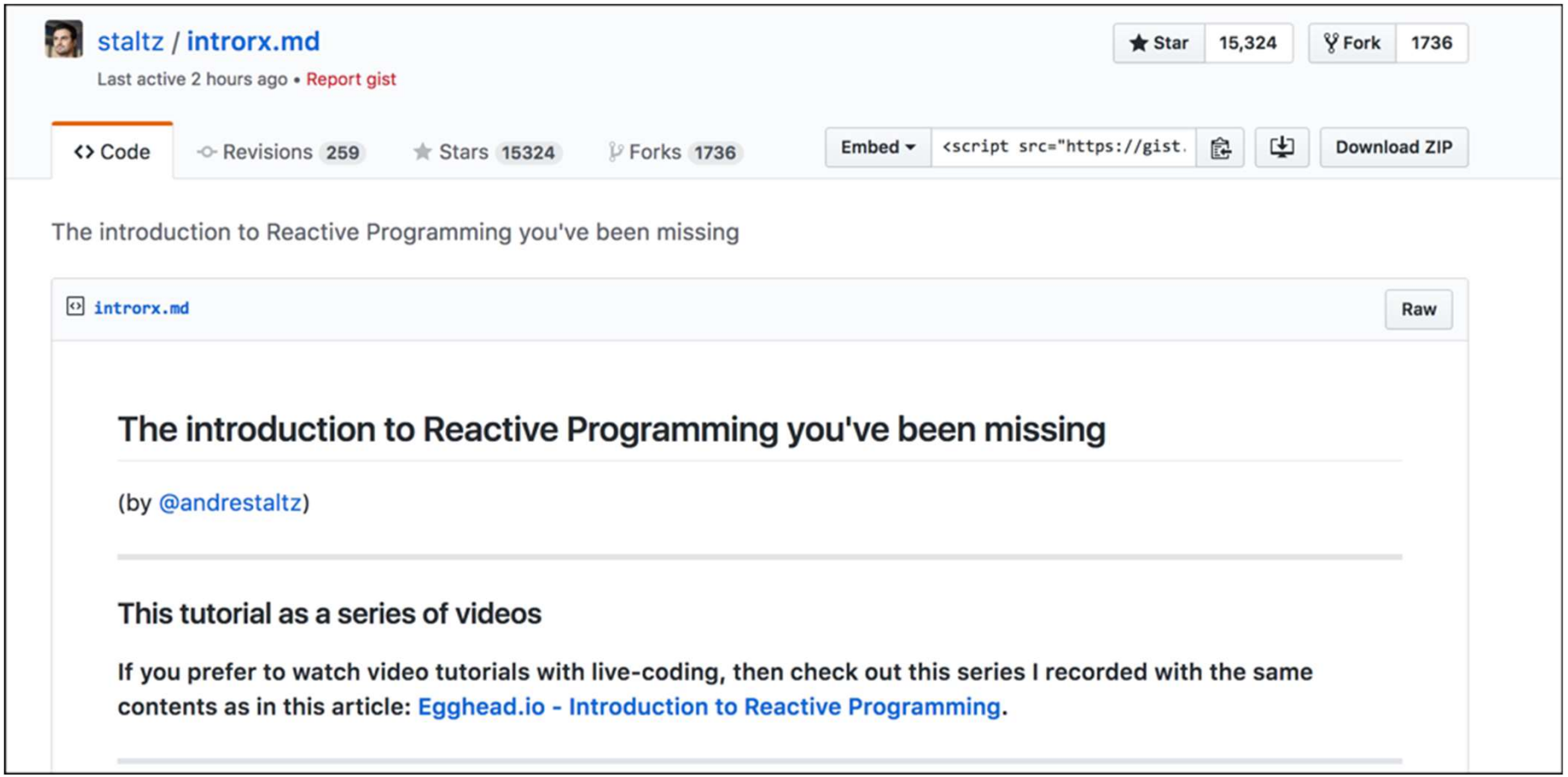


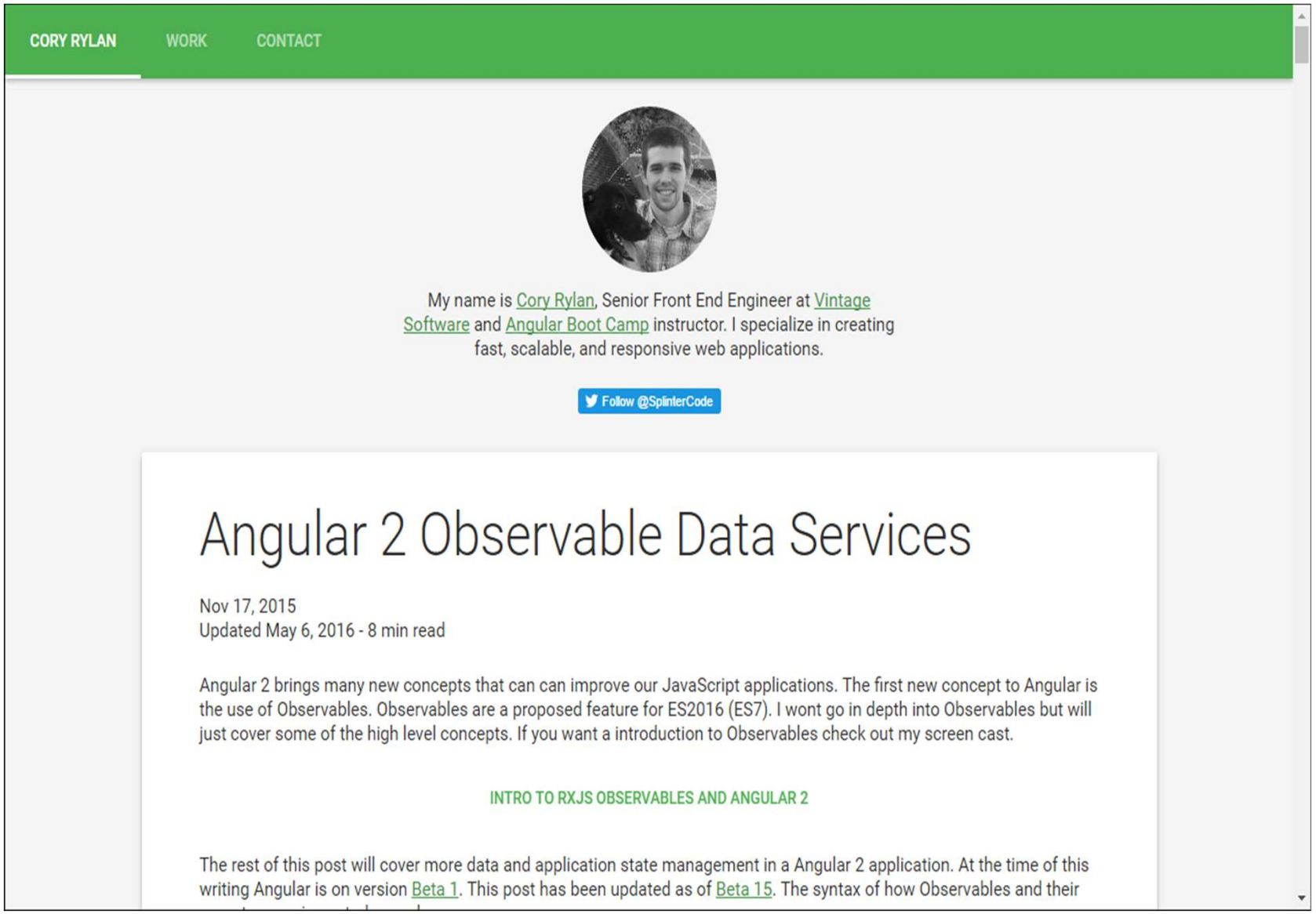
Meer over Observables



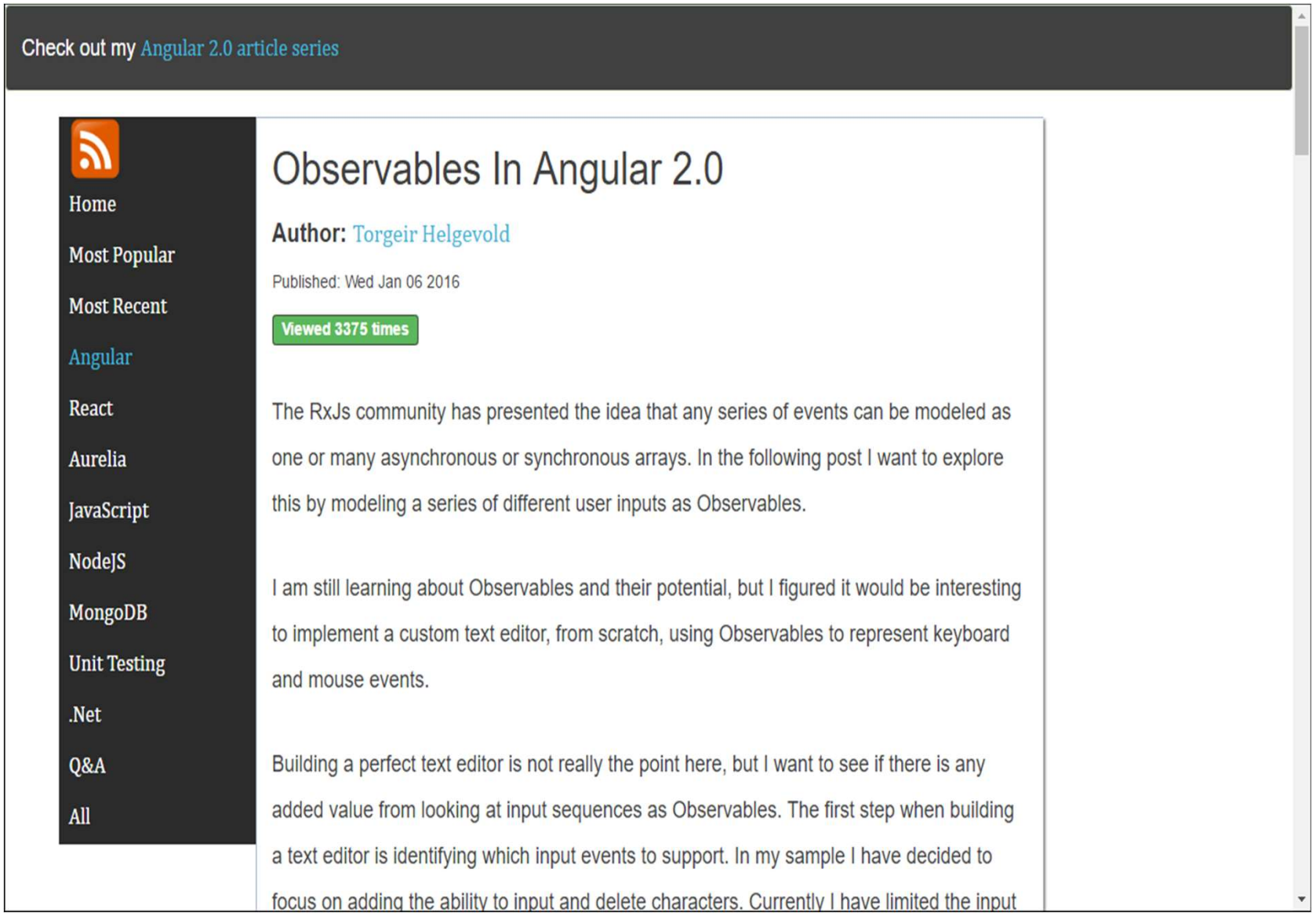
http://blog.thoughtram.io/angular/2016/01/06/taking-advantage-of-observables-in-angular2.html

Andre Stalz – introductory article





https://coryrylan.com/blog/angular-2-observable-data-services



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